

TABLE 5. DOMESTIC PRODUCERS' SHIPMENTS COMPARED WITH MARKET SHARE OF NONINTEGRATED FIRMS

	Total Shipments by Domestic Producers (millions of tons)	Actual Market Share of Nonintegrated Firms (percent of specific product)	Potential Market Share of Noninte- grated Firms (percent of specific product)
Flat Rolled Products			
Sheets	33.6	0	0
Coated Products/ Tin Plate	5.7	0	0
Large Structural Shapes and Rails	5.2	5	10
Plates	8.1	5-10	25
Semi-Finished Products	5.3	5	10
Pipe and Tubing	9.1	5	25
Other			
Bars and Small Shapes	13.3	50	85
Wire	1.8	30	100

SOURCE: American Iron and Steel Institute, Annual Statistical Report (1980).

Office of Technology Assessment, U.S. Congress Technology and Steel Industry Competitiveness (June 1980), p. 257.

Personal Conversation with Joseph Wyman, Shearson American Express, February 17, 1982.

in 1981. ^{10/} At an average labor cost per hour in 1981 of \$20.50, the advantage in labor costs for the nonintegrated firm is \$60 to \$80 per ton. Similarly, the material costs of making steel have averaged \$10 to \$15 per ton lower for scrap-based processes than for integrated processes. Although the nonintegrated firms have slightly higher financial costs per ton, and produce lower-priced products than the integrated producers, their profits per ton have usually exceeded those of the integrated firms. Since 1974 pretax profit margins of nonintegrated firms averaged 10.0 percent, compared with 3.2 percent for integrated firms. Return on equity has averaged 14.9 percent, compared with 5.9 percent for integrated firms. ^{11/} As a result, the nonintegrated firms have grown while the integrated firms have contracted.

Labor Costs

In addition to price competition, labor costs have been a primary contributor to the decline of the integrated steelmakers. Labor productivity growth since 1966 was not only slower in basic steel than in any other industry in the United States (except other primary metals), but steel wages also rose faster than any other. ^{12/} Wage rates in the domestic steel industry have grown so fast in the last decade that compensation for steelworkers in 1980 averaged 176 percent of the average manufacturing wage. Although this can be explained in part by the workers' skill and experience, as well as by hazardous working conditions, the wage differential has become a major cost disadvantage to domestic producers.

Labor costs in the United States in 1981 are estimated to be about \$184 per ton shipped, compared to estimates of \$143 per ton in West Germany and \$111 per ton in Japan. ^{13/} Domestic nonintegrated producers were able to produce steel products at labor costs of \$100 to \$130 per ton. Direct comparisons are difficult, however, because some producers rely on contract workers for some of the tasks included in the production process.

If the U. S. industry had continued the productivity gains it attained during the growth period of 1950 to 1970, the high wage rates would not have become a competitive factor. But productivity increases after 1970 slowed considerably. This was primarily because world capacity exceeded demand, and new investment slowed. For example, from 1950 to 1970 the amount of capital stock available per U.S. worker grew at an average of 5.0 percent per year. As a result, tons produced per worker increased by 2.8 percent per year. Since 1970, productive capital has increased by only 0.4 percent per year, tonnage per worker by only 1.0 percent per year. ^{14/}

Management

The industry has also been criticized for management inflexibility—or a reluctance to adjust to changing circumstances. There is no objective way to evaluate the management of an industry, and it is not the intent of this paper to make such an evaluation. However, many of the decisions made by managements of integrated firms have not turned out well either because of sheer bad luck or other reasons. For example, it appears that most integrated firms did not:

- o foresee that demand would not grow, and take appropriate action to reduce capacity;
- o aggressively pursue cost-saving innovations or develop new product lines;
- o realize that scrap would become so plentiful that nonintegrated operations would be less costly than integrated ones;
- o control the rapidly rising labor costs;
- o use their assets or leverage to increase cash available for investment; or
- o anticipate that other nations would subsidize their producers rather than cut capacity.

Decisions on these matters involved high risks. If the integrated steelmakers had been more aggressive, they might be in a better position today. On the other hand, in an industry that is not growing, and with firms that are in a precarious financial situation, a wrong decision can jeopardize a company's whole future. For this reason, management spokesmen believe that they have been prudent, rather than overly conservative.

Innovation

The U.S. steel industry has been innovative in some cases, but slow to adopt new technology in others. For example, several studies have addressed the conversion to basic oxygen furnaces during the 1960s. They conclude that domestic integrated producers were reluctant to introduce oxygen furnaces; however, after the furnaces became a proven and advantageous technology, no major producing country converted its existing plant to an optimal mix of basic oxygen furnaces more rapidly than the United States. 15/

By contrast, the acceptance of another, more recent, innovation--continuous casters--has been quite slow. Continuous casters are able to provide substantial savings of manpower and energy, and reduce the amount of waste steel. Continuous casting also provides a higher quality product. Several countries--Japan, West Germany, and Italy--have installed casters much faster than the United States, and most nonintegrated mills now use continuous casters. Because these casters provide unusually high returns on investment, the reluctance of the domestic integrated firms to invest is difficult to explain. The industry cites the constrained financial situation in the late 1970s and its pessimistic view of the future. Since late 1980, however, construction of 13 new large casters has been announced. These will double U.S. casting capacity in about three years.

On balance, it seems that most integrated firms were not as aggressive in adopting continuous casters as they were with basic oxygen furnaces. This reluctance has added to domestic integrated firms' competitive disadvantage.

Environmental Regulations

The domestic industry has spent about 18 percent of recent capital investment on pollution control--more per unit of sales than any other major industry. ^{16/} However, competitor nations have also invested in pollution control and some evidence suggests that their investment per ton of output may have exceeded that in this country. Estimated expenditures for European environmental requirements are incomplete, but the control strategies in some countries are similar in effect to those of the United States. In Japan, for example, pollution control expenditures have been at least as great as in the United States. In general, environmental regulations appear to have added about 4 to 5 percent (\$15 to \$20 per ton) to the world price of steel. ^{17/}

Taxes

Before 1981, the industry claimed that domestic tax rates discouraged long-term investment because the depreciation rates were too slow relative to other industries and other nations. ^{18/} Until the passage of the Economic Recovery Tax Act of 1981 (ERTA), the United States permitted 55 to 60 percent of investment to be recovered in three years. In contrast, Canada, France, Italy, and Great Britain permitted 75 to 109 percent recovery in three years. ^{19/} Furthermore, several nations, including West Germany, Belgium, France, and Italy, have encouraged exports by rebating taxes on them. This rebate averages 11 to 20 percent of total tax liabilities

in these countries. ^{20/} Supportive tax treatment is held by many to be a principal cause of the thriving Canadian steel industry. Canadian aggregate corporate steel taxes as a percentage of profits averaged 6.75 percentage points less than U. S. taxes during the mid-1970s. ^{21/} However, international comparisons of tax treatment are necessarily imprecise because the basic tax structures differ markedly.

The Economic Recovery Tax Act of 1981 changes the domestic situation fundamentally. It shortens depreciation periods and eliminates the linkage between profitability and taxes by allowing certain tax benefits to be sold. This will be an increasingly important benefit to the industry in the future. By the mid-1980s, ERTA may increase cash available for investment by steel firms by \$400 to \$550 million per year, equivalent to an increase in cash flow of 12 to 17 percent per year. ^{22/} Whether these funds will be invested in steel operations, however, is open to question.

CURRENT FEDERAL ROLE

The federal role has three components: trade policy, regulations for health/environmental purposes, and social programs designed to deal with problems of transition and adjustment due to unemployment.

Trade Policy. World overcapacity in steel production was a concern by the end of the 1960s. In 1968, the United States negotiated several voluntary limitations with importers (called Voluntary Restraint Agreements) to avoid what was then viewed as a temporary dislocation in markets due to overcapacity and exchange rates. These agreements lasted until 1974, but were not effective after 1972 because of high world demand. In 1974, the Trade Act was passed. It defined dumping as selling below average production cost (and also used the traditional definition of selling exports below the home market price). When the world supply of steel exceeded demand again in 1977-1978, U.S. imports surged to 18 percent of the domestic market. Domestic producers brought suit under the Trade Act of 1974, asserting that certain imports were being sold below production costs. These suits were withdrawn after the creation of the Trigger Price Mechanism (TPM) in 1978. The trigger price, based on Japanese production costs, was intended to be an indicator of the lowest price that would not constitute dumping, or selling below average production cost. The TPM would be a lower bound for price competition and would limit unit losses due to price cutting. The 1978 TPM had no "surge" provision, or constraint on the quantity imported.

The TPM was modestly effective in providing a price floor as long as demand was high, but when demand declined in 1980, and again in 1981,

importers found that they lost markets. As a result, prices for imported steel--and to a lesser extent, domestic steel--drifted below the trigger price. Because the TPM is easily circumvented, it became ineffective and was abandoned.

Domestic producers brought suit in 1981 under the Tariff Act of 1930. They have sought administrative relief through countervailing duties and anti-dumping duties to compensate for foreign subsidies and sales below production costs. These suits are being processed by the Department of Commerce (DOC) and the International Trade Commission (ITC). The DOC is responsible for finding whether or not steel has been sold below production cost or subsidized, and the ITC for assessing whether material injury has occurred. These procedures are lengthy and very complex. Furthermore, duties are limited to the period after a preliminary finding of dumping or subsidies.

No suit involving major steel products has yet run its full course. At the present time, suits involving several Western European countries, Romania, and Brazil are being investigated by DOC and ITC.

Regulatory Policy. Because the steel industry is inherently dirty, noisy, and dangerous, there have been many efforts to improve conditions through regulation. These have imposed financial and operational burdens on the producers. In 1981, Congress passed the Steel Industry Compliance Extension Act, designed to relieve part of the burden if the producers used available funds for investment in modernization. Similarly, administrative changes have reduced some of the health and safety requirements.

Transition and Adjustment. Trade readjustment allowances are intended to ease the transition of certain laid-off workers to new employment. In 1980, 690,000 applications were filed that gave competition from imports as a primary cause of unemployment--of which about 130,000 were from former steel industry employees.

Until fiscal year 1982, workers displaced by imports could receive supplemental compensation through trade adjustment assistance at the same time that they received the normal unemployment insurance benefits. Together these could amount to about 70 percent of previous wages for up to 52 weeks of unemployment. This was changed in 1982 so that workers first receive their unemployment insurance for 26 weeks--equivalent roughly to 40 percent of previous wages--followed by an equal amount of supplemental trade readjustment allowance for another 26 weeks.

The readjustment program also includes services such as job placement, retraining, relocation allowances, counseling, and testing.

OUTLOOK FOR THE FUTURE: STEEL IN THE 1980s

The outlook given below for integrated steelmaking in the 1980s is not intended as a forecast. Rather, it is a projection of the outcomes associated with current federal policies and industry conditions. It is meant to serve as a point of departure for assessing whether alternative federal policies are worth considering and, if so, which are likely to be most helpful. The outlook is based on a set of projections of world steel demand, U.S. steel demand, and the market share that the domestic industry will achieve. The consequences in terms of employment, investment, and capital stock in the steel industry can then be estimated.

World Demand for Steel. World overcapacity in steelmaking is likely to persist, although current conditions will almost certainly improve. In 1981, the non-Communist sector operated at 68 percent of capacity. This projection suggests that the 1985-1990 operating rate will average between 70 and 77 percent, the same range that prevailed during the 1970s. As a result, competitive pressures in world steel markets will abate somewhat but nevertheless remain intense.

Many forecasters are optimistic that domestic steel demand will surge through 1984, because they expect a recovery in the economy. They differ as to whether demand after 1984 will continue to grow or will return to the stagnant conditions of the 1970s. This variance could result in the two scenarios for 1990 steel demand shown in Table 6. Under one assumption, steel consumption increases in 1983 and 1984 and then continues on its 1950-1981 trend line. Less optimistic assumptions about demand, and about penetrations of imports into new markets, could result in the lower scenario. 23/

Net imports are projected to increase over the decade because of continued overcapacity in the major steelmaking nations. Under the high projections, demand in home markets could reduce the need for many steel exporters to cut prices in order to sell in U.S. markets. Thus net U.S. imports are less in the high case than in the low case. Furthermore, in the low case, lack of investment would forfeit more new markets to importers than in the high case. Shipments of steel by domestic producers in 1990 remain within the range of recent experience under both cases, but the share of domestic production taken by the nonintegrated producers increases markedly. As a result, the market share of integrated producers falls from its 1981 level of 72 percent of the domestic market to between 61 and 66 percent by 1990.

TABLE 6. PROJECTIONS OF DOMESTIC CONSUMPTION AND SHIPMENTS OF STEEL (In millions of tons per year)

	1979	1980	1981	1982	1990	
					Low	High
Domestic Demand	115	95	105	105	118	127
Net Imports into U.S.	15	11	17	14	26	22
Domestic Shipments	100	84	88	91	92	105

Shipments from Integrated Producers	89	72	76	78	72	84
Shipments from Nonintegrated Firms	11	12	12	13	20	21

SOURCE: Data in 1979 and 1980 are from AISI. Data for other years are CBO estimates.

Effects of Alternative 1990 Projections

Each of the 1990 projections carries with it different implications for investment and employment in the steel industry (see Table 7). Under the high scenario, the steel industry would probably invest roughly \$30-37 billion (in 1980 dollars) in steel operations over the coming decade. This is more than the \$19-26 billion that would be invested under the low scenario because higher margins would provide a greater incentive for investment.

The work force of the integrated producers would decline from its 1981 strength of 390,000 in both cases. In the high case, the labor force would decline to the range of 320,000-350,000 workers as productivity improvements offset the higher demand for steel. In the low case, the labor force would decline to the 275,000-305,000 range. By contrast, employment in the nonintegrated firms would rise from 30,000 in 1981 to around 50,000 in both 1990 projections.

A final concern--the ability of the integrated steelmakers to compete in new, fast-growing markets--is less subject to quantitative estimates. As the economy evolves, it demands increasingly sophisticated products from the steel industry. Among these are coated sheet steel, seamless alloy pipes, corrosion-resistant plates, and wide-diameter pipes. Domestic producers have been unable to provide a number of new products in recent years and do not seem to be investing to provide them in the future. In time, the nation may become more dependent on imports for high-quality products, so that foreign industries that embody high-quality steel in their products might gain an advantage over domestic industries.

TABLE 7. PROJECTIONS OF OUTPUT, INVESTMENT, AND EMPLOYMENT FOR INTEGRATED PRODUCERS

	1981	1990	
		Low Demand	High Demand
Output of Integrated Firms in 1990 (millions of tons)	76	72	84
Cumulative Capital Investment 1981-1990 (billions of 1980 dollars)	---	19-26	30-37
Investment in 1985 (billions of 1980 dollars)	---	2.2-2.7	3.2-4.0
Average Age of Facilities (years)	18.0	21.1	16.6
Employment (in thousands)	390	275-305	320-350

SOURCE: CBO estimates.

BRIEFING PAPER FOOTNOTES

- 1/ Joseph Wyman, Steel Mini Mills (Shearson Loeb Rhoades, November 20, 1980), p. 1.
- 2/ Standard and Poor's Industry Surveys, Steel-Coal, Basic Analysis (October 30, 1980), p. S 69.
- 3/ Standard and Poor's Industry Surveys, Steel-Coal Current Analysis (June 5, 1980), p. S-37.
- 4/ American Iron and Steel Institute, Steel at the Crossroads (January 1980), pp. 21 and 38.
- 5/ Peter Marcus, The Steel Strategist #5 (Paine, Webber, Mitchell, and Hutchins, Inc., February 1982), p. 13.
- 6/ The Official Journal of the European Communities reports on member government activities to promote steel, including use of subsidies. For example: "Medium-term Orientation for Steel Research" (May 2, 1981) and "State Aids" (November 9, 1981, and April 12, 1981).
- 7/ Dieter Spethman, Chairman of the Board of Thyssen (West Germany's largest steelmaker), in the Wall Street Journal (February 6, 1981).
- 8/ American Metal Market (Washington, D.C., March 18, 1981).
- 9/ Joseph Wyman, Steel Mini-Mills (Shearson Loeb Rhoades, Inc., November 20, 1980), p.1.
- 10/ Joel Hirschhorn, Continuing Success for United States Mini-Mills (draft), Office of Technology Assessment, no date, p. 5. Joseph Wyman, Shearson American Express, personal conversation on February 17, 1982, and Peter Marcus, World Steel Dynamics; Core Q (Paine, Webber, Mitchell, and Hutchins, Inc., September 1981), p. 1-6. Comparable estimates for Japan and West Germany are 9.6 and 11.0 man-hours per ton respectively.
- 11/ Joseph Wyman, Steel Mini-Mills.
- 12/ Beatrice Vaccara and Patrick MacAuley, "Evaluating Economic Performance of U.S. Manufacturing Industries," Industrial Economics Review (Department of Commerce, Summer 1980), p. 17.

- 13/ Peter Marcus, World Steel Dynamics: Core Q (Paine, Webber, Mitchell, and Hutchins, Inc., September 1981).
- 14/ Donald Barnett, "Labor Productivity Trends in the U.S. Steel Industry," Economic Papers (American Iron and Steel Institute, October 29, 1980).
- 15/ Office of Technology Assessment, Technology and Steel Industry Competitiveness (1980), p. 286. Walter Adams and Joel Dirlam, "Big Steel, Invention and Innovation," Quarterly Journal of Economics (May 1966), pp. 168-189.
- 16/ American Iron and Steel Institute, Annual Statistical Report (1980), p. 10. The petroleum and electrical utility industries have invested more in the aggregate, but not per unit of sales (Bureau of Economic Analysis, Department of Commerce).
- 17/ Robert Crandall, The U.S. Steel Industry in Recurrent Crisis (Brookings, 1981), p. 39.
- Analysis of Economic Effects of Environmental Regulations on the Iron and Steel Industry (Temple Barker and Sloane, for EPA, July 1977).
- Environmental Policy for the 1980s (Arthur D. Little, Inc., for American Iron and Steel Institute, 1981).
- An Economic Analysis of Proposed Efficient Limitations (Temple Barker and Sloane, for EPA, December 1980).
- Impact of New Source Review Policy on Capacity Expansion (Piedco Environmental, Inc., for EPA, October 1979).
- 18/ Steel at the Crossroads.
- 19/ Technology and Steel Industry Competitiveness, p. 59.
- 20/ Technology and Steel Industry Competitiveness.
- 21/ Statistics Canada, National Income and Expenditure Accounts, 1972-1977. U.S. Department of Treasury, Internal Revenue Service, Corporation Income Tax Returns, 1972-1977.
- 22/ Letter to Honorable Joseph Gaydos from Jane Gravelle, Congressional Research Service, Library of Congress (February 10, 1982), and discussion with author on March 3, 1982.
- 23/ Steel consumption as a function of real GNP has declined since 1970. Before that time, however, it had a steady relationship. If it continues its post-1970 behavior, future demand will fall at or below the 1965-1981 trend line.

APPENDIX: ADDITIONAL EXPLANATORY TABLES AND FIGURE.

TABLE A-1. FINANCIAL COMPARISONS OF NONINTEGRATED WITH INTEGRATED FIRMS SINCE 1974 (In percents)

	Pretax Profit Margin	Net Return on Assets	Net Return on Equity
NonIntegrated Firms	10.0	8.5	14.9
Large Integrated Firms	3.2	3.1	5.9

SOURCE: Joseph Wyman, Steel Mini-Mills (Shearson Loeb Rhoades, Inc., November 20, 1980), p.4.

The integrated firms included U.S. Steel, Inland, Bethlehem, National, Republic, and Armco. The comparison would have been worse for the integrated producers if the smaller integrated firms were included or if income from non-steel operations were excluded.

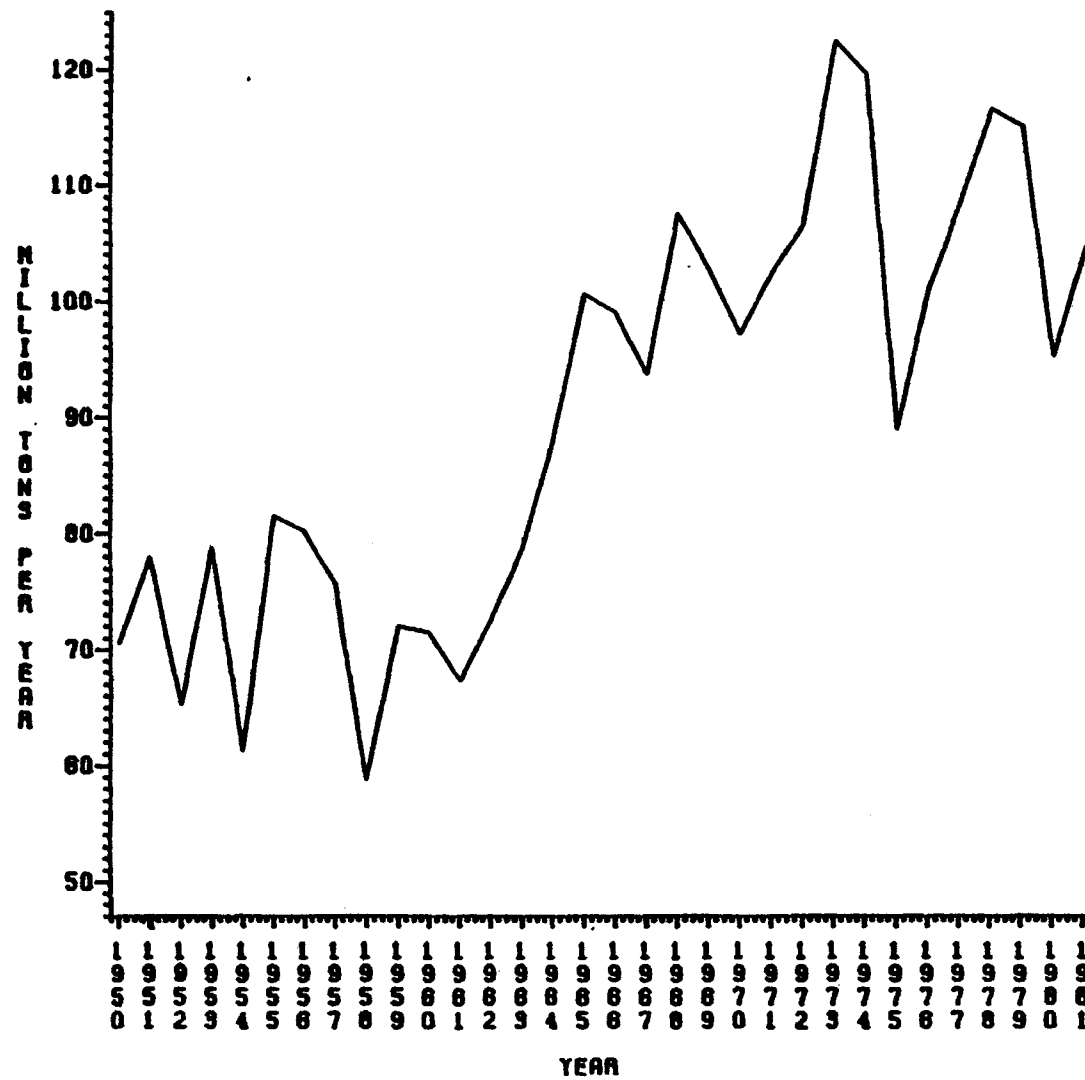
Nonintegrated firms were Athlone, Florida, Lukens, Northwestern, Nucor, Roblin, and Union.

TABLE A-2. PROJECTED CONSUMPTION OF STEEL PRODUCTS (Millions of tons per year)

	1979 Actual	1981 Estimated	1985 Mid- Range	1990	
				Low	High
Automotive	20.8	15.4	18.3	17.8	19.4
Construction	17.6	14.4	18.1	18.6	21.4
Rail Transportation	6.5	6.1	6.5	6.5	6.8
Oil and Gas Industry	5.4	7.2	8.6	8.1	8.4
Machinery	11.0	9.9	11.7	12.6	13.6
Electrical Utilities	3.5	3.3	4.0	4.7	4.9
Domestic Appliances	5.3	4.6	5.9	6.1	6.7
Containers	6.9	6.4	7.1	7.1	7.3
Service Centers and Others	77.6	34.5	36.8	36.5	38.5
Inventory Changes	<u>0.3</u>	<u>2.8</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total	114.9	104.6	113.0	118.0	127.0

SOURCES: Data Resources, Inc., for 1979; CBO for 1981, 1985, and 1990.

FIGURE A-1. UNITED STATES CONSUMPTION OF STEEL PRODUCTS, 1950-1981



SOURCE: American Iron and Steel Institute, Annual Statistical Reports.

